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Agonist-induced adherence of equine eosinophils to fibronectin.

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Eosinophils are believed to play an important part in the pathogenesis of equine diseases such as helminth infestation and the allergic skin disease, sweet itch. It has been shown that adherence of human eosinophils to the connective tissue matrix protein fibronectin enhances cell activation and survival time. If adherence causes similar changes in the properties of equine eosinophils, cell-induced tissue damage at a site of parasitic infestation or allergic response would be exacerbated. However, investigation of this hypothesis requires identification of mediators that cause equine eosinophil adherence. Since the equivalent recombinant equine proteins were not available, the present study reports the effects of recombinant human (rh) C5a and IL-5 on the adherence of equine peripheral blood eosinophils (EPBEs) to fibronectin in vitro. The effects of LTB4 and PAF on EPBE adherence to fibronectin were also examined and phorbol myristate acetate (PMA) was used as a positive control. PMA caused a dose-related increase in EPBE adherence to fibronectin-coated plastic. In comparison, rh C5a produced a much smaller response which was only evident at the highest dose tested. On the other hand, rhIL-5 induced a small, but significant dose-related increase in EPBE adherence. Moreover, this response was in part dependent on the beta 1 integrin Very Late Antigen-4 (VLA4). Since adherence to serum-coated plastic was also increased by IL-5, beta 2 integrins may be activated and or up-regulated on EPBEs by the cytokine. Neither LTB4 nor PAF caused EPBE adherence to fibronectin but prior incubation with these mediators increased the response of cells to IL-5. There were no differences between the responses of EPBEs isolated from horses with clinical signs of sweet itch and normal animals. Thus, whilst up-regulation of IL-5-induced adherence may occur locally in tissues in vivo, it does not appear to take place in the circulation. Finally, C5a, PAF and LTB4, but not IL-5, caused equine neutrophil adherence to fibronectin demonstrating the different responses of granulocytes to these mediators. The results obtained in the present study have shown that mediators which may be released at sites of inflammatory or allergic reactions can induce or enhance eosinophil adherence to tissue matrix protein. Thus, these mediators can now be used in future studies to determine if cell adherence may alter eosinophil activation or survival time.